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ABSTRACT

This study investigated whether participation in a computer lab would improve high school students' performance on Spanish vocabulary, grammar, and listening comprehension. Students participated in classroom and computer lab activities. Analysis of student data (including student surveys) throughout five units indicated that the computer lab was a beneficial tool, benefiting some students more than others. Some of the students' favorite lab-based activities were a Spanish study Web site and a grammar tutor. Favorite classroom activities included flashcards and games. Most students felt that having an instructor present in the computer lab increased their learning potential. Nearly all of the students enjoyed having a regularly scheduled lab period. Most students believed that the lab improved their listening skills and made class more interesting. Students stated that they preferred to learn vocabulary and grammar in the classroom, while they learned listening skills better in the computer lab. Four appendixes present assessment scores for units of vocabulary study, the student survey, student survey results for Spanish II, and student survey results for Spanish III. (Contains 14 references.) (SM)

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Does the computer lab improve student performance on vocabulary, grammar, and listening comprehension?

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B.S., University of Wisconsin – Eau Claire, 1998

A thesis submitted to the

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2002

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Does the computer lab improve student performance

on vocabulary, grammar, and listening comprehension?

written by Ann Frigaard

has been approved for the Department of Education

Dr. Thomas Sherman

Date 12/12/02

The final copy of this thesis has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline.

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Does the computer lab improve student performance on vocabulary, grammar, and listening comprehension?

Thesis directed by Dr. Thomas Sherman

Technology has become an integral part of today's society in the workplace, in the schools, and at home. The foreign language department has enjoyed many of these benefits. There are many activities that are available for use through the textbook companies, the Internet, and other software. All of these sources provide grammar or vocabulary practice. This study has shown that the students that used the computer labs for practice scored slightly higher on assessments than those that did practice exercises in the classroom.

Table of Contents

Chapter

I: Introduction.....1

A. Need for Study 1

B. Statement of the Problem 1

C. Statement of the Question 2

D. Definition of Terms.....2

E. Limitations of the Study.....3

II: Literature Review.....5

III: Data Collection Process.....8

A. Participants and Procedures.....8

B. Data Collection Tools.....9

C. Data Collection 10

IV: Analysis of Data.....11

A. Process.....11

B. Results.....14

V: Conclusion.....18

References 20

Appendices.....22

Tables

List of Tables

1. Student Sample.....8

2. Computer Lab vs. Classroom.....11

3. Computer Lab vs. Classroom 2.....12

4. Unit 4, Lesson 3.....12

5. Unit 5, Lesson 1.....13

6. Preterit Phrases.....13

7. Food.....13

8. Verbs.....13

9. A Students.....14

10. B Students.....15

11. C Students.....15

12. D Students.....15

Chapter I
Introduction

The foreign language departments in the Rochester Public School district are fortunate for the fact that there are new foreign language computer labs in each of the three high schools. These labs are used by more than 700 students weekly. Although the schools divide their time differently, it works out that all of the teachers have one day for each class period in the lab every week. One school splits the time so the students have two 25-minute time periods and another has one entire class period each week.

Since the start of my study, the computer labs have been updated with new software and capabilities. Therefore, in the process of my research, my focus has slightly changed. At the beginning of this study, I was struggling with the fact that the computer lab had become an easy way out for many students. For some of our grammar drills they can sit at their computer and just click on an answer, rather than have to hear it, say it, or spell it. For the video activities, the students know they are able to listen as many times as they want, rather than have to listen more closely on the first or second try. For vocabulary exercises, the computer will give them the correct answer rather than having to look it up themselves. Some students have enough motivation to challenge themselves to learn this way, but there are others that need guidance to stay on task and analyze their mistakes. I am also finding that the 50 minutes of student contact time that is lost each week

affects the teacher/students relationships. Since the labs have been updated, our options of activities have quadrupled and I am now able to focus on deciding which activities are the most educationally beneficial for the students.

The question that I have researched is: Does the computer lab improve student performance on vocabulary, grammar, and listening comprehension? As I worked through this issue I was able to find a variety of information on how the students do in the computer lab versus the classroom, which activities are more beneficial, and which students benefit most from the classroom versus the laboratory.

The terms grammar drills, vocabulary activities and video activities are ones that are frequently used throughout the study. The term vocabulary activities simply pertains to exercises that drill the students on the specific vocabulary words for the chapter of study. Some of the most commonly used vocabulary activities for this study were QUIA and Dasher. QUIA is a website that has been created for educators. It has been widely used in the foreign languages and there is a yearly fee for educators to belong. With this fee comes the privileges to use the site to create activities and games for the students to use. They are able to use these in the schools along with accessing them at home at anytime. Once an activity is created, the students are able to practice their vocabulary words by playing a concentration game, doing matching exercises, working through a word find, or studying the flashcards.

The other vocabulary exercise is Dasher. This is part of the Idiom Software package that was used for the foreign languages in the Rochester Public

School District. It is simply a drill and practice activity that allows students to recite the vocabulary words. The computer presents a word in English and the students need to type the vocabulary word in Spanish. It records their scores and makes them continue until they have correctly recalled each of the vocabulary words.

The term grammar drills refers to repetitious practice activities that students are able to do on the computer to practice whatever grammar topic is being studied at that time. Two of the activities that are representative of the grammar practice are Grammar Tutor and Study Spanish. The first one is again part of the Idiom software package that allows students to practice the grammar that is being studied by filling in the blanks. The second is a website created specifically for Spanish learners. It begins each topic with an explanation of the grammar point, followed by many examples, and finishes with a quiz that can be taken and graded for the user.

The term video activities refers to a series of videos that compliments each chapter of the textbook that is used in the Rochester Public School District. There are questions and exercises that go along with the videos. This series can be used both in the computer lab and on VHS in the classroom.

One of the most prevailing limitations in this study is the functioning of the computers. Because the computer lab is so tightly scheduled each week there were many computer days that were lost because of extenuating circumstances such as: the district network was down, school was canceled, some computers

weren't functioning which didn't allow each student to work on his/her own computer, etc.

The results of this study were also affected by the difference in ability levels of the students, the difficulty of each unit of study, the varying levels of prior knowledge, outside preparation time for the assessments, attitudes towards Spanish class, and especially student attendance. If a student missed a day they were unable to benefit from the practice that was done in classroom or in the computer lab.

Chapter II
Literature Review

Technology Enhanced Language Learning is rapidly developing in many universities and high schools (Salaberry, 2001). Because of the fact that technology redefines itself every three to five years, it is difficult to find current research. There are numerous benefits in using language labs in the foreign language classroom. The most prevalent is the fact that students tend to be more motivated. The responsibility is placed on the student for their own learning, which encourages them to be more engaged in their learning. The class is more student-centered because each student can learn at his or her own pace. Each student is more actively involved in the process of higher-level thinking. They also gain confidence by directing their own learning. (Brownlee-Conyers, 1996; Dwyer, 1996) By using the language laboratories, students are more focused, spend more time on task and in turn spend more time using the target language. This is a key advantage since the time each day using the target language is minimal in a fifty-five minute class period (Glisan, Dudt, & Howe, 1998).

Research has shown that in a Technology Enhanced Language Learning classroom, constructivism plays a large role in the design of the class (Blyth, 1997; Brooks & Brooks, 1993). Students take an active role in their learning rather than simply being a recipient of knowledge. The students are able to take responsibility for their own learning and the teacher serves more as a facilitator

than a provider of information. They are able to work at their own pace, take advantage of time and opportunities, and are required to use higher-order thinking skills for many of the tasks.

By using technology in the foreign language classroom, students have immediate access to news, people, cultural information, and images from all over the world. It helps to bring the real world into the classroom (Cononelos & Olivia, 1993; Mandlove, 2002). According to a study done in1997 by McBride, a professor at Ohio State University, approximately 75% of the students preferred a technology-based classroom (McBride, 1997). Not only are the students learning a foreign language and about a culture, they are also learning skills that will be carried with them into the job market.

Many things affect the effectiveness of technology bases acquisition. A study titled "Visible or Invisible Links: Does the Highlighting off Hyperlinks Affect Incidental Vocabulary Learning, Text Comprehension, and the Reading Process?" by Isabelle DeRidder from the University of Antwerp presents factors that influence vocabulary learning. In this research, it is stated that certain factors such as color, space, and size can increase language acquisition. Another enhancement would be to highlight difficult words or provide links to extra information. (Cuhn & Plass, 1996; DeRidder, 2002). There are also some studies that challenge the results for the use of technology in the foreign language classroom. A study by Black, Right, Black, & Norman found that by using language acquisition techniques, such as the ones previously described, students

are only benefiting for short-term purposes and long-term retention is almost nonexistent (Black, Wright, Black, & Norman, 1992).

Another negative aspect of Technology Enhanced Language Learning is the loss of teacher-student interaction time. Research shows that students value the contact time with the teacher. In a classroom where interactions are reduced, students are less likely to ask questions and some students may find the learning activities and curriculum to be more difficult. Although the teacher takes on the role of facilitator in a technology-based classroom, it is crucial to use well-developed instructional skills (Glisan, et al., 1998; McGrath, 1998, Weiss, 1994).

Chapter III
Data Collection Process

Spanish I students from three sections at Century High School made up the student sample for this study. The majority of these students were freshmen and there were also a few sophomores. Deciding how to select a student sample was a challenging process. I was not able to simply compare class averages because my classes were very unbalanced during the time of the study. One class carried an average of 84% while another had only a 75% average. To compare the two classes would have made the results very insignificant.

The way the students were selected is by their first semester grades in Spanish class. From each section of Spanish 1, I selected two students that had an A first semester, one boy and one girl. Then I selected two students with a B and so on. This allowed for a sample of students with similar scores from each class. The student sample is as follows:

	Female	Male
A	3	3
B	2	3
C	3	3
D	2	2

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Because of the lack of a student with a specific grade, there are some sections with only two students. In Spanish I there are very few students with low grades therefore it was impossible to find enough students with a D average to fill the student sample. The other problem arose because the fifth hour class was very small and did not have a female with a B average. The sample is made up of eleven males and ten females, a total of twenty-one students.

After selecting the students, I chose the units of study to focus on. During third quarter there were five different units of vocabulary. The first unit was taken from Unit 4, Lesson 3 of the DIME UNO textbook. Throughout this unit the students in fifth hour spent two, twenty-five minute periods in the computer lab and the other two classes spent the same amount of time studying vocabulary in the classroom. Two of the activities in the lab included QUIA and Dasher. The activities that were done in the classroom included things such as flashcard practice with a partner, writing the words for spelling practice, Around-the-World (a game that requires students to recall the words faster than their competitor) or Sparkle (a game that requires students to practice spelling the words).

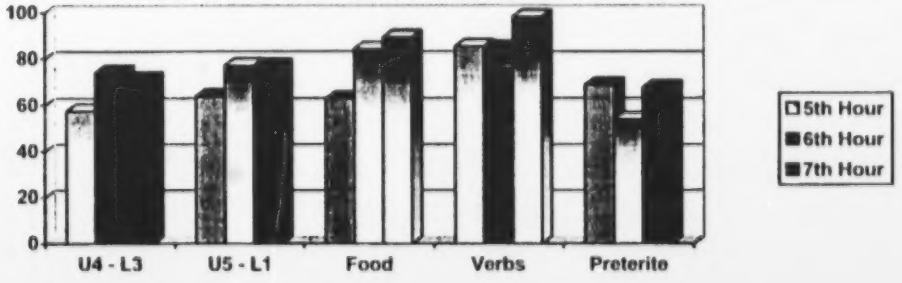
The second unit of study was once again from the DIME UNO textbook for Unit 5, Lesson 1. For this unit, 6th hour was in the computer lab and the other two classes stayed in the classroom doing many of the same activities. The following unit focused on food. In the lab, sixth and seventh hour students did an exercise which allowed them to order different foods off a menu and the computer filled their plates as they were ordering. I also created a similar activity that the students in the classroom did with a partner for this unit. For the fourth unit, fifth

and seventh hours studied infinitive verbs in the computer lab while sixth hour remained in the classroom. And the last unit of study included the phrases that indicated the use of the past (preterit) tense. For this unit sixth hour was in the computer lab and the other two classes remained in the classroom. The scores were recorded for each student for each unit and later compared. I was able to look at the difference between lab usage versus computer usage, along with the difference between males and females and also the upper and lower level students and how the lab did or did not improve assessment scores.

The other data collection tool that was used was a survey (Appendix A). Seventy-three girls and fifty-six boys were given a survey asking a variety of questions about activities that are done in the computer lab and the classroom and how he/she feels each one helps to increase learning.

Chapter III
Analysis of Data

At the end of the quarter, after all of the units of vocabulary had been completed, I was able to put all of the scores into charts to compare how the computer lab affects student achievement (appendix A). The first chart I looked at included a comparison between classes. As stated earlier, this was an unfair comparison due to the different ability levels in each class. There is no consistency in the scores of the students that studied vocabulary in the computer lab being higher or lower than those in the classroom. In the following chart, the solid bars represent practice that was done in the classroom and the bars with white as a second color represent units that were studied in the computer lab.



After seeing the lack of results from this comparison, I looked at a chart with only the twenty-one students that were selected for the student sample. This was a better comparison due to the fact that it looked at only a limited number of students with similar scores in Spanish class. The following chart shows the difference in scores between the computer lab and the classroom using the scores solely from the twenty-one student sample.

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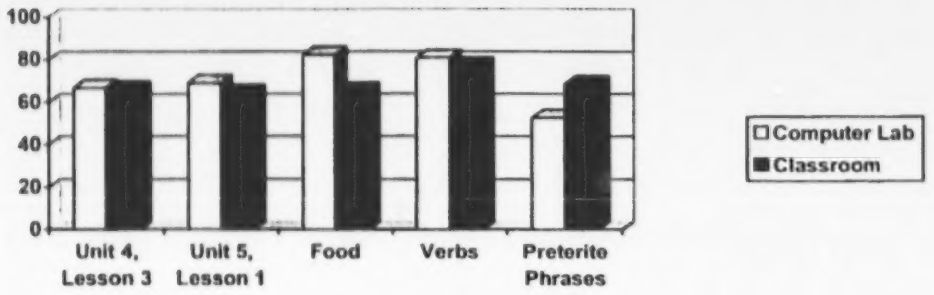
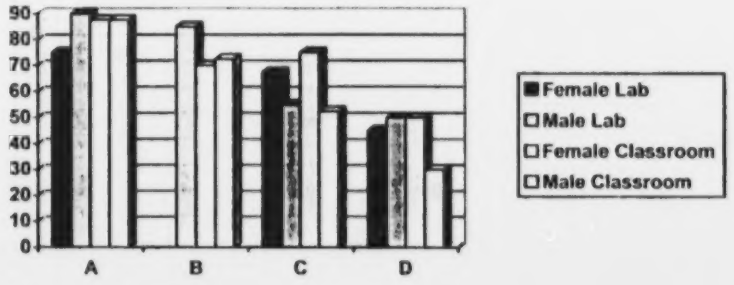


This chart shows that the students that used the computer lab to study vocabulary words scored slightly higher on all assessments except for the final one. Although the difference was often minimal, the students did score better if they used the lab for practice.

Not only did I look at how the students did as a group, I also compared the males and females and the difference between them. The following charts display how each gender did in the computer lab versus the classroom. There is no score for females with a B average due to the fact that in fifth hour there was not a girl to with that score.

Unit 4, Lesson3



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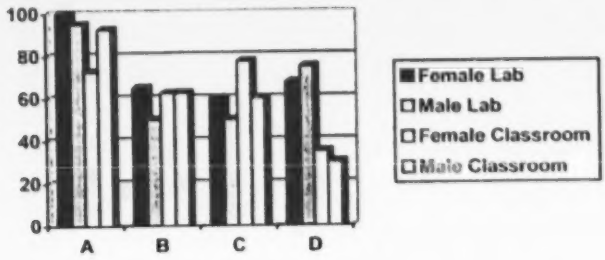
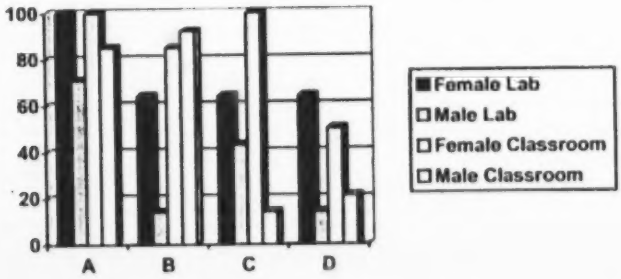
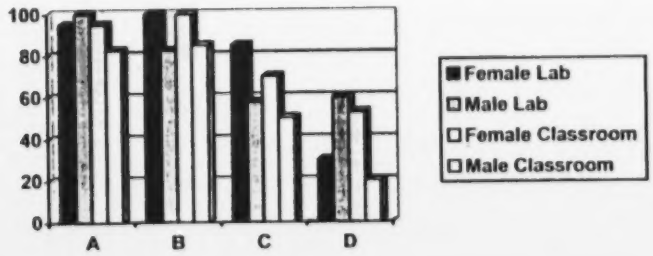
Unit 5, Lesson 1



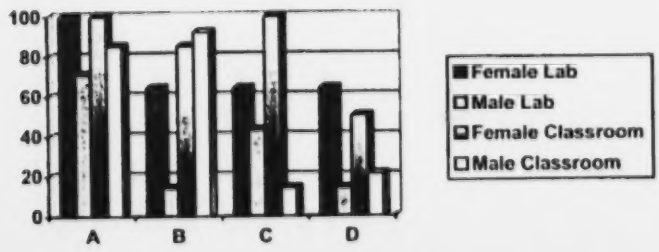
Preterit Phrases



Food



Verbs



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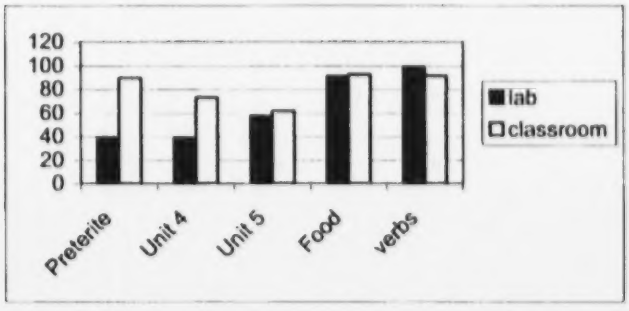
By studying the preceding charts, one is able to see that the scores for the girls are very inconclusive as to which is better, the computer lab or the classroom. The females' scores vary from chapter to chapter. For example, the females scored better in the classroom for unit 4, but better in the computer lab for unit 5. There was not a difference in scores for the unit on food, verbs, or preterit phrases.

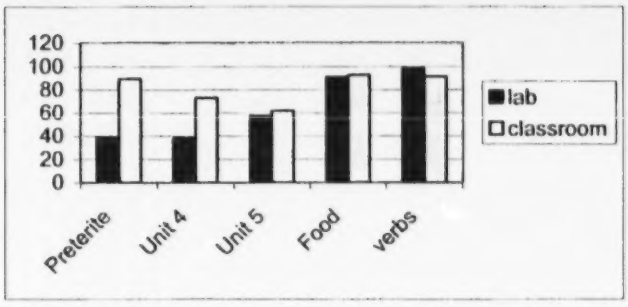
The males were a little different. Overall, they scored higher in the computer lab than in the classroom. For unit 4, unit 5, and the unit on food, their scores were higher in the lab. For the other two units, there was little difference between the two.

The conclusion that I was able to draw from these charts is that the males tend to learn better using the computer lab for practice exercises than the females do.

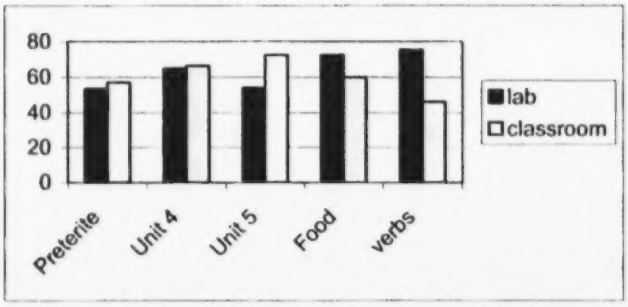
I also compared the students with an A average, B average, C average, and D average. The following charts display those results. For these comparisons, the male and female scores are combined.

A Students

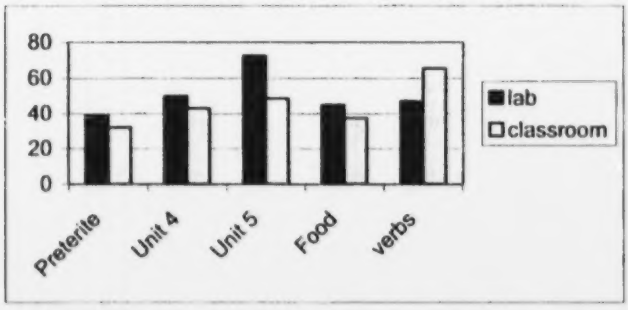




B Students



C Students



D Students

After analyzing these charts it is noticeable that the A students and the D students benefit most from doing their practice in the computer labs. The students with B and C averages vary from unit to unit.

The other tool I used to research this question was a survey (appendix B), which was given to 129 students. The students were asked to rank a variety of activities between 1 and 5. One being the least helpful in preparing for an assessment and 5 being the most helpful. They were also asked some questions about how they feel they learn best. The results were very interesting. Although the males disagreed with the statement 'I learn more Spanish language skills in the lab than I do in the regular classroom', they were more likely to score better in the computer lab. The results from this survey can be found in Appendix C and D.

Some of the student's favorite lab based activities included www.studyspanish.com and Grammar Tutor. Favorite classroom activities include things such as flashcards, and of course games such as Around-the-World or Sparkle.

Other interesting results from the study include:

- 77% agree that having an instructor present in the computer lab increased the learning potential.
- 93% of the students enjoyed the learning environment of having a regular scheduled lab period.
- 84% believed that their listening skills improved.
- 72% of the students agree that the information from the lab activities contributed greatly to their knowledge of Spanish grammar and vocabulary.
- 85% agreed that the lab made the class more interesting.
- 21% use some of the computer-based activities at home.
- 46% agreed and 46% disagreed that they learn more in the computer lab.

- A majority of the students prefer to learn vocabulary and grammar in the classroom.
- According to the students, they learn listening skills better in the computer lab.

Chapter V
Conclusion

After studying the scores for the different students throughout the five units I am able to determine that the computer lab is a beneficial tool for students. As with all activities, the ones in the lab benefit some more than others. The students enjoy using the lab and feel that it helps to make the class exciting and interesting.

As I stated earlier in the paper, when this research was started the students were working in different labs than what they have now. Over the past year, the foreign language computer labs have all been updated with new capabilities and activities. Therefore, from this research I am able to come to two conclusions. The first one is that the vocabulary scores differ so slightly that I am going to focus lab time on more activities that are not so effective in the classroom such as the listening exercises or the video series. I have also concluded that there are many students that are benefiting from the activities in both the classroom and the computer lab. It is essential to have a variety of activities in both places.

This study has given me a lot of useful information that I am able to apply in my Spanish classes. However, as with any study, there are things that could be improved upon. The first thing I would change would be to narrow the study. I would focus simply on vocabulary, grammar, or listening exercise. I also would like to try this study on upper level students. There is a large maturity level difference between ninth grade students and eleventh grade students. I would foresee the results being very different.

As a language department, we are fortunate to have the resources for a language lab to enhance our curriculum. The essential thing now is deciding which activities are most beneficially taught in the computer lab versus in the classroom.

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Appendices

Appendix A ..... Assessment Scores for Units of vocabulary study

Appendix B ..... Student Survey

Appendix C ..... Student Survey Results Spanish II

Appendix D ..... Students Survey Results Spanish III

Appendix A

Results Between Lab Usage and Classroom Practice

Results of Comparisons between lab usage/ classroom practice

Student	Average Grade	Unit 4, Lesson 3	Unit 5, Lesson 1	Food Vocab	Vocab - Verbs	Preterite Phrases
5AA	90%	18	**18**	**17**	36	**7**
5AB	90%	15	**13.5**	**19**	36	**6**
5BA	86%	17	**15.5**	**17**	36	**7**
5CA	72%	11	**15**	**10**	21	**1**
5CB	76%	13.5	**14**	**14**	33	**7**
5DA	65%	10	**9**	**4**	20	**1**
5DB	65%	9	**7**	**10.5**	18	**3.5**
class		57.63	**64**	**62.89**	85.38	**68.8**
6AA	94%	**16**	19	20	**36**	5
6AB	92%	**18**	20	19	**36**	7
6BA	80%	**17**	10	17	**30**	1
6BB	79%	**16**	13	20	**36**	4.5
6CA	70%	**11.5**	10	18	**15**	3
6CB	69%	**12**	11.5	17	**28**	4
6DA	69%	**9.5**	15	19.5	**16**	1
6DB	71%	**10**	14	6	**32**	4
class		**74.14**	77.16	84.29	**84.67**	54.08
7AA	94%	**19**	**19**	20	36	**5**
7AB	90%	**17**	**17**	19	36	**7**
7BA	83%	**10**	**10**	16	33	**6**
7BB	80%	**12**	**12**	20	36	**6**
7CA	77%	**9.5**	**9.5**	15	19	**1**
7CB	78%	**18**	**18**	17.5	36	**7**
7DA	36%	**2.5**	**2.5**	5	12	**2.5**
class		**71.2**	**77.04**	89.38	98.31	**67.6**
total		20	20	20	36	7
Male			In Lab			
Female			**In Class**			
** Unit 5, Lesson 1 - Vocabulary unit on directions; 32 words						

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Appendix B

Student Survey

Give the following activities a number between 1 and five. Five being the most helpful in preparing for a quiz or exam and 1 being the least helpful.

1. QUIA .	1	2	3	4	5
2. Study Spanish.com.	1	2	3	4	5
3. Doing flashcards with the class	1	2	3	4	5
4. Pair practice in the classroom	1	2	3	4	5
5. Dasher drills in the lab	1	2	3	4	5
6. Grammar Tutor	1	2	3	4	5
7. Pair communicative activities (in the class room)	1	2	3	4	5
8. Worksheets	1	2	3	4	5
9. G exercises in the textbook	1	2	3	4	5
10. Vocab games (Sparkle, bingo, around the world, etc)	1	2	3	4	5
11. Grammar games (dice game, verb relays, etc)	1	2	3	4	5

I learn vocabulary better	in the lab	in the classroom.
I learn grammar better	in the lab	in the classroom.
I do listening exercises better	in the lab	in the classroom.

Rate the following questions as	Strongly Disagree	Disagree	Agree	Strongly Agree
1. Having an instructor present during the lab increased the learning potential in the class.	1	2	3	4
2. Once I learned how to do the activities, the presence of the instructor was not necessary.	1	2	3	4
3. I liked the learning environment of having a regular scheduled lab period.	1	2	3	4
4. My listening skills in Spanish improved as a result of the lab activities.	1	2	3	4
5. I learn more Spanish language skills in the lab than I do in the regular classroom.	1	2	3	4
6. The information from the lab activities contributed greatly to my knowledge of Spanish grammar and vocabulary.	1	2	3	4
7. The learning experiences in the computer lab made this a more interesting class.	1	2	3	4
8. I enjoyed the videos in the lab.	1	2	3	4
9. I like learning a language using some computer assisted activities.	1	2	3	4
10. I would enjoy using the lab more days each week.	1	2	3	4

I use web pages such as QUIA or studyspanish.com at home. Yes No
If yes, which ones?

Grade _____ M/F

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Appendix C

Student Survey Results – Spanish II

	1	2	3	4	5	
1. QUIA .	2	13	23	39	10	
2. Study Spanish.com.	0	5	34	37	24	
3. Doing flashcards with the class	1	6	17	47	29	
4. Pair practice in the classroom	2	13	29	24	13	
5. Dasher drills in the lab	4	14	35	35	14	
6. Grammar Tutor	2	5	32	39	22	
7. Pair communicative activities	1	11	35	40	12	
(in the class room)						
8. Worksheets	2	19	31	36	12	
9. G exercises in the textbook	5	19	16	38	1	
10. Vocab games (Sparkle, bingo,	5	6	19	31	39	
around the world, etc)						
11. Grammar games (dice game,	4	5	21	26	33	
verb relays, etc)						
	in the lab		in the classroom			
I learn vocabulary better	42		58			
I learn grammar better	40		60			
I do listening exercises better	85		15			
Rate the following questions as	Strongly			Strongly		
	Disagree	Disagree	Agree	Agree		
1. Having an instructor present during the	0	16	77	6		
lab increased the learning potential in the class.						
2. Once I learned how to do the activities, the	3	29	58	14		
presence of the instructor was not necessary.						
3. I liked the learning environment of having a	0	6	63	30		
regular scheduled lab period.						
4. My listening skills in Spanish improved as a	1	14	54	30		
result of the lab activities.						
5. I learn more Spanish language skills in the lab	4	46	46	5		
than I do in the regular classroom.						
6. The information from the lab activities	0	21	72	7		
contributed greatly to my knowledge of						
Spanish grammar and vocabulary.						
7. The learning experiences in the computer lab	0	15	59	26		
made this a more interesting class.						
8. I enjoyed the videos in the lab.	3	19	58	22		
9. I like learning a language using some	0	6	62	31		
computer assisted activities.						
10. I would enjoy using the lab more days	0	13	49	38		
each week.						
			Yes	No		
I use web pages such as QUIA or studyspanish.com at home.			21	79		
If yes, which ones?						
Grade		M/F				

Results of survey for Spanish II classes.

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Appendix D

Student Survey Results – Spanish III

	1	2	3	4	5	
1. QUIA .	0	7	43	39	9	
2. Study Spanish.com.	0	4	26	41	26	
3. Doing flashcards with the class	0	5	25	33	36	
4. Pair practice in the classroom	7	4	43	30	13	
5. Dasher drills in the lab	4	0	36	44	15	
6. Grammar Tutor	0	0	25	53	21	
7. Pair communicative activities	3	3	39	41	14	
(in the class room)						
8. Worksheets	2	9	40	33	16	
9. G exercises in the textbook	2	8	38	36	16	
10. Vocab games (Sparkle, bingo,	7	5	24	33	31	
around the world, etc)						
11. Grammar games (dice game,	9	7	24	27	33	
verb relays, etc)						
	in the lab		in the classroom			
I learn vocabulary better	63		37			
I learn grammar better	36		64			
I do listening exercises better	65		35			
Rate the following questions as	Strongly			Strongly		
	Disagree	Disagree	Agree	Agree		
1. Having an instructor present during the	2	11	76	11		
lab increased the learning potential in the class.						
2. Once I learned how to do the activities, the	0	47	42	11		
presence of the instructor was not necessary.						
3. I liked the learning environment of having a	0	2	65	33		
regular scheduled lab period.						
4. My listening skills in Spanish improved as a	2	11	69	18		
result of the lab activities.						
5. I learn more Spanish language skills in the lab	4	52	46	2		
than I do in the regular classroom.						
6. The information from the lab activities	2	22	63	13		
contributed greatly to my knowledge of						
Spanish grammar and vocabulary.						
7. The learning experiences in the computer lab	4	9	64	22		
made this a more interesting class.						
8. I enjoyed the videos in the lab.	4	4	60	30		
9. I like learning a language using some	0	5	75	20		
computer assisted activities.						
10. I would enjoy using the lab more days	2	11	41	46		
each week.						
			Yes	No		
I use web pages such as QUIA or studyspanish.com at home.			49	51		
If yes, which ones?						
Grade		M/F				

Results of survey for Spanish III classes.

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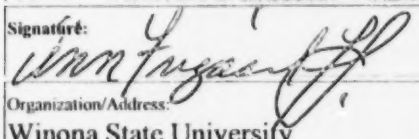
Signature: 	Printed Name/Position/Title: Ann Frigaard	
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